International Society for Nutraceuticals and Functional Foods

ISNFF Newsletter **Volume 4, Issue 1**
March 2011

The activities of the ISNFF during 2010 included a short course on Nutraceuticals, Functional Foods and Dietary Supplements in Ghent, Belgium (June 17-18, 2010) and one on Marine Nutraceuticals in St. John's, Canada (September 7, 2010). These symposia were attended each by participants from 10 or more countries and were a total success.

The 3rd International Conference and Exhibition on Nutraceuticals, Functional Foods and Dietary Supplements and its pre-conference event were held at the Inna Grand Beach Hotel in Bali, Indonesia, October 11-15, 2010. Over 500 individuals belonging to academia, industry, and governments from 21 countries participated. There were 28 lecture sessions, including three plenary sessions that encompassed 122 oral and 175 poster presentations. The conference was opened by the representative of the Minister of Agriculture of Indonesia with a marvelous display of cultural performance from Bali; the welcoming dinner was addressed by the Minister himself. The conference was very successful and surpassed all expectations. It was complemented with exhibitions from both local and international companies as well as optional technical tours. Elsevier was among the publishers in the Exhibition Hall. There were several awards given out including the Society's Industry Merit Award and the Fereidoon Shahidi Fellowship Award. Best poster presentation awards were also made.

The conference was complemented by an exhibition that displayed products and services as well as books and journals from publishers. The awards presented to firms and individuals were as follows:

Industry Merit Award
Amino Up Company, Japan
Science and Service Merit Award
Professor Young-Joon Surh, National University of Korea
Fereidoon Shahidi Fellowship Award
Jung-Ae Kim, Pukyong National University, Korea
Best Poster Presentation Awards
Sung-Myung Kang (First Place), Jeju National University, Korea
Puspita Sari (Second Place), Bogor Agricultural University, Indonesia
Bahareh Sarmadi (Third Place), Universiti Putra Malaysia, Malaysia

The 4th International Conference and Exhibition of the ISNFF will be held November 14-17, 2011 in Sapporo, Japan. Dr. Kazuo Miyashita is the local conference chair, and we look forward to participation of all those interested in the latest developments in the field. For further information about the 2011 meeting, please visit the ISNFF website at <isnff.org>.

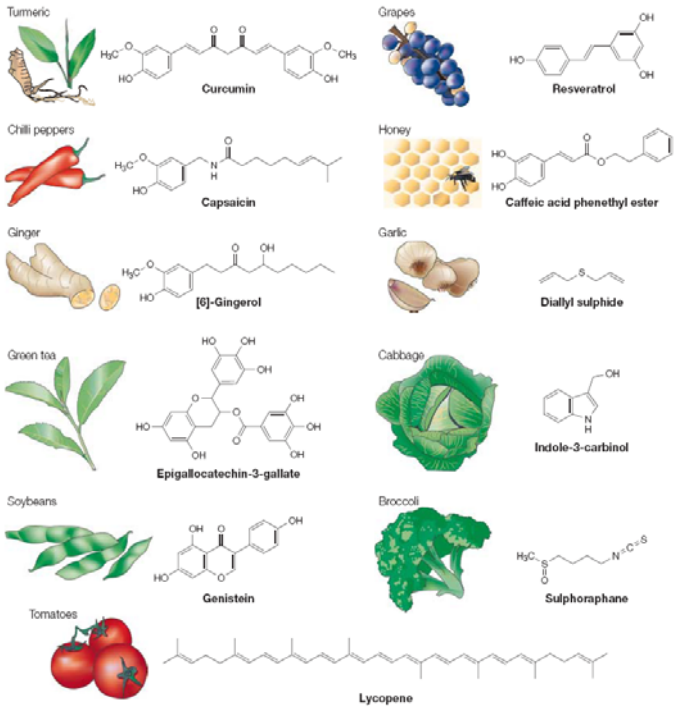
Applications and/or nominations for awards should be made to Professor Chi-Tang Ho at ho@AESOP.Rutgers.edu and copied to the Society's secretary, Ms. Peggy-Ann Parsons at ISNFFsecretary@gmail.com

Fereidoon Shahidi, Executive Board Member and Event Coordinator, ISNFF

Chemopreventive Effects of Nutraceuticals and Functional Food Ingredients
Dr. Young-Joon Surh, WCU Department of Molecular Medicine & Biopharmaceutical Sciences, College of Pharmacy, Seoul National University, South Korea

Chemoprevention, the term coined by Michael Sporn in the mid 1970s, is defined as the use of non-toxic chemical substances to inhibit the development of invasive cancer either by blocking DNA damage that initiates carcinogenesis, or by arresting or reversing the progression of premalignant cells in which such damage has already occurred. In consideration of sluggish improvement in the overall survival rate of cancer patients under chemo- or radiation therapy, chemoprevention is considered to be an innovative approach to reduce the global burden of cancer.

Chemopreventive phytochemicals and their dietary sources

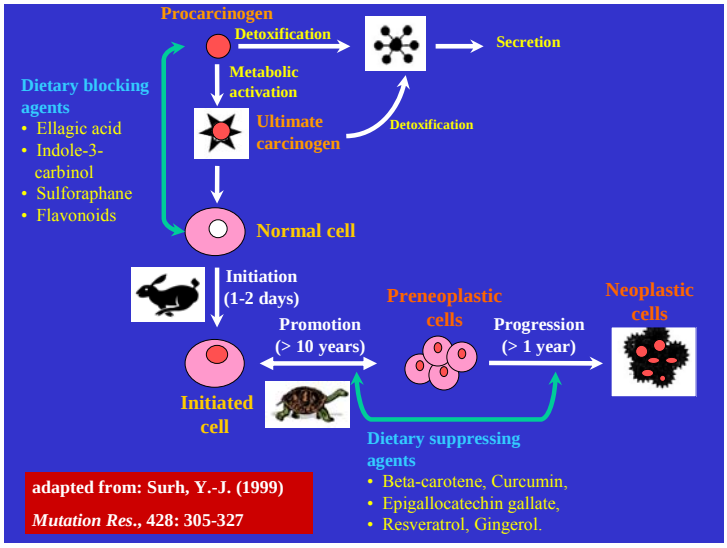


A wide variety of substances present in our diet, especially those found in fruits, vegetables, spices and herbs, have been shown to possess pronounced cancer preventive properties. These include curcumin in Indian spice (turmeric), genistein in soya, lycopene in tomato, epigallocatechin gallate in green tea, resveratrol in red wine or grapes, indole-3-carbinol in cabbage, and sulforaphane in broccoli, to name a few. The chemopreventive effects of these edible phytochemicals are likely to result from the modulation of several distinct cellular processes, which include the blockage of metabolic activation and DNA binding of carcinogens, stimulation of detoxification, repair of DNA damage, suppression of cell proliferation, attenuation of inflammatory responses, induction of differentiation or apoptosis in transformed cells, inhibition of tumor angiogenesis and metastasis, *etc*. Intracellular signaling network comprising cell surface receptors, various protein kinases and transcription factors maintain cellular homeostasis.

Mechanisms of chemoprevention with phytonutrients

Oxidative stress and inflammatory tissue damage are two major culprits implicated in the pathogenesis of cancer as well as many other human disorders. Reactive oxygen species and some pro-inflammatory molecules disrupt the cellular signal transduction network and contribute to abnormal expression of genes involved in carcinogen metabolism, cellular

proliferation, inflammation, apoptosis, and angiogenesis. Many dietary chemopreventive agents, either alone or in combination, maintain a precise control over cellular redox status by suppressing activation of various upstream kinases, their downstream transcription factors and their regulators.



Nuclear transcription factor erythroid 2p45 (NF-E2)-related factor 2 (Nrf2) plays a crucial role as a master redox switch in regulating induction of antioxidant or cytoprotective gene expression. Some bioactive ingredients of nutraceuticals and functional foods have been found to activate this particular redox-sensitive transcription factor, thereby potentiating cellular antioxidant and anti-inflammatory defense capacity.

From an evolutionary perspective, many phytochemicals normally function as toxins, *i.e.,* '*phytoalexins*' that protect the plants against insects, other damaging organisms and stresses. However, at the relatively low doses consumed by humans and other mammals these same "toxic" phytochemicals activate adaptive cellular stress response pathways that can protect the cells against a variety of adverse conditions. This phenomenon has been widely observed in biology and medicine, and has been referred to as preconditioning or hormesis. The majority of chemoprevention research with functional foods and nutraceuticals has largely been conducted at the preclinical level. Well-designed and controlled human intervention trials with defined individual bioactive substances or their mixtures will help start the new era of personalized medicine for successful prevention of cancer in near future. So as Dr. Peter Greenwald, one of the world-renowned scientists in the area of cancer chemoprevention research, pointed out, "someday people should be able to avoid cancer or at least delay its onset by taking specially formulated pills of nutraceuticals or functional foods".

References

1. Surh, Y.-J. 2003. Cancer chemoprevention with dietary phytochemicals. *Nature Reviews Cancer, 3*, 768-780.
2 . Surh, Y.-J., Kundu, J.-K., and Na, H.-K. 2008. Nrf2 as a master redox switch in turning on the cellular signaling Involved in the induction of cytoprotective genes by some chemopreventive phytochemicals. *Planta Med.*, *74*, 1526-1539.
3. Surh, Y.-J., Dong, Z., Cadenas, E., and Packer, L. 2008. *Dietary Modulation of Cell Signaling Pathways*, CRC Press-Taylor & Francis, Boca Raton, FL.
4. Gllett, N.P., Ruhul Amin, A.R., Bayraktar, S., Pezzuto, J., Shin, D.M., Khuri, F.R., Aggarwal, B.B., Surh, Y.-J., and Kucuk, O. 2010. Cancer prevention with natural compounds. *Sem. Oncol.*, *37*, 258-281.

Supercritical Fluid Processing of Nutraceuticals and Functional Foods

José L. Martinez, Thar Process, Inc., Pittsburgh, PA, USA
jose.martinez@tharprocess.com

In the last decade, new trends in the food industry have emerged due to concerns regarding the quality and safety of food products, increased preference for natural or organic products, and more stringent regulations related to the residual levels of solvents. The nutraceutical and functional food sector represents one of the fastest growing areas in a consumer-driven market. These trends have made supercritical fluid technology, a solvent-free technology, the primary alternative to traditional solvent methods for the extraction and fractionation of active ingredients.

The physicochemical properties of supercritical fluids are intermediate of the gaseous and liquid state. They exhibit gas-like transport properties of diffusivity and viscosity, directly related to mass transfer and hydrodynamic properties, and liquid-like density, directly related to solvent power. Additionally, the surface tension is negligible allowing easy penetration into solid matrices.

Carbon dioxide is the preferable supercritical fluid because it is non-toxic, inflammable, easily available, convenient to use because of its critical parameters (T = 31 °C {87.8 °F}, Pc = 73.8 bar {1,070 psi}), inexpensive, environmentally friendly and generally recognized as safe by the FDA and EFSA. Additionally, because carbon dioxide processing requires low temperatures it maintains the integrity of thermally-labile compounds. Another advantage of using carbon dioxide is that the potential for oxidation of the extract is significantly minimized. The main drawback of supercritical carbon dioxide, however, is its low polarity, which is overcome by adding polar co-solvents like ethanol in low quantities (1-10%).

A unique characteristic of supercritical fluids is the ability to tune their solvent strength and selectivity by varying the pressure and temperature. Because of this, supercritical fluids are often used to selectively extract or separate specific compounds from a mixture. One procedure is by a fractional extraction process. In this case, the extraction is carried out in successive steps by increasing the operating pressure or increasing the polarity of the solvent. Another procedure is by carrying out a fractional separation of the extracts by sequential depressurization. In this case, the plant is equipped with two or three separators in series operating at different pressures and temperatures.

Additional advantages offered by supercritical fluid technology are as follows: no solvent residues; lower operating costs compared with conventional solvent extraction; generally higher concentration recoveries of bioactive compounds; no further purification steps; and in some cases, the raffinate (*i.e.*, the material left over after extraction) has a highly marketable value due to the fiber and protein content (oil-free), which could target new product lines in the organic and functional food market, such as snack bars, light cereals or protein concentrates, as well as longer shelf life of the products.

Most of the development and industrial implementation of supercritical fluid technology has been on supercritical fluid extraction from solid feed materials. In the last decade extensive research and development has been carried out in new concepts. In addition to extraction, application areas include fractionation of liquid mixtures, supercritical fluid chromatography, impregnation, coatings, cleaning, supercritical drying and particle formation. Some industrial applications of supercritical technology in nutraceuticals and functional foods are listed below:

- Extraction of specialty oils:
    - Extraction of specialty oils from the following seeds: roasted sesame, chia, and sea buckthorn.
    - Recovery of residual oil after mechanical press of roasted sesame seed.
    - Extraction of almond oil.
    - Extraction of wheat germ oil.
- Processing of spices: ginger, clove, fennel, paprika, and chili.
- Extraction of antioxidants:
    - From *Labiatae* herbs: rosemary, sage, thyme and oregano.
    - Concentration of tocopherols from the deodorized distillate in oil refining operations.
    - Astaxanthin from from *Haematococcus pluvialis*.
- Purification of micronutrients from palm oil by supercritical fluid chromatography.
- Fractionation of polyunsaturated fatty acids.
- Purification of EPA and DHA by supercritical fluid chromatography.

Supercritical fluid technology is a truly viable technology in the nutraceutical and functional food sectors replacing conventional technologies and providing solutions that traditional technologies cannot offer. In order to successfully implement this technology it is necessary, however, to fully understand it, focusing on the optimization of the plant design and components as well as the process parameters that provide minimum operating costs.

Further Readings and References:

1. Martinez, J. L. 2007. Supercritical Fluid Extraction of Nutraceuticals and Bioactive Compounds, CRC Press, Taylor & Francis Group: Boca Raton, FL.
2. Brunner, G. 2010. Applications of supercritical fluids. *Ann. Rev. Chem. Biomol. Eng., 1*, 321-342, 2010.

ISNFF Title and Abstract Submission

CALL FOR PRESENTATION PAPERS 2011
Nutraceutical, Functional Foods, and Dietary Supplements:
Science, Methodologies and Applications
November 14-17, 2011
Royton Sapporo Hotel
Sapporo, Japan

I would like to attend and present:	☐ Oral ☐ Poster ☐ Oral or Poster
Title:	
Abstract (150 words or less):	
Authors: (underline the presenting author):	
Address:	
Telephone:	
Fax:	
E-mail:	

Deadlines: Title and abstract submissions, respectively, June 20 and August 29, 2011
(Complete form and return to Ms. Peggy-Ann Parsons, Fax: 1-709-864-4000 or E-mail: ISNFFsecretary@gmail.com)

2011 ISNFF Conference Registration
November 14-17, 2011
Royton Sapporo Hotel
Sapporo, Japan

First Name: Middle Name:

Family Name: Title:

Affiliation:
Address:

E-mail: Tel: Fax:

Categories		Till August 29, 2011	After August 29, 2011
Conference registration	Member	US $425	US $495
	Non-member	US $495	US $575
	Student member	US $195	US $245
	Student non-member	US $245	US $295
	Exhibitor	US $2,995 (includes 2 registrations) Double US $4,995	US $4,000 Double US $6,000
Conference registration, membership		US $520	US $590
Conference registration, membership, and Journal		US $620	US $720
Gala Dinner		US $85	US $100

Total amount: US $

Payment:
Certified Cheque: Payable to the ISNFF
Credit Card: VISA MASTERCARD
Credit Card #:
Card Holder:
Expiry Date:

(Please fill in the form and fax to conference secretary, Ms. Peggy-Ann Parsons at (709) 864-4000 or scan and e-mail to ISNFFsecretary@gmail.com).

International Society for Nutraceuticals & Functional Foods

MEMBERSHIP APPLICATION 2011

Last Name: **First Name:**

Company / Institution / University:

Address :

Telephone : Fax :

E-Mail Address :

New Membership		☐
Renewal		☐
Cancel Membership		☐
Member	**$95 USD**	☐
Student Member	**$45 USD**	☐
Corporate Member	**$2,000 USD**	☐

Payment Method:

Money Order/Cheque: ☐

(Make cheque payable to ISNFF)

Credit Card: VISA ☐ MASTERCARD ☐

Credit Card #:

Card Holder:

Expiry Date:

Please complete form and return to Conference Secretary, Ms. Peggy-Ann Parsons at:
ISNFF, P.O. Box 29095, 12 Gleneyre Street, St. John's, NL, A1A 5B5, Canada;
E-mail: ISNFFsecretary@gmail.com

International Society for Nutraceuticals & Functional Foods

2011 Annual Conference

Functional Foods, Nutraceuticals, Natural Health Products and Dietary Supplements

November 14-17, 2011
Sapporo, Japan

International Advisory Board

Dr. Cesarettin Alasalvar (Turkey)
Mr. Anthony Almada (USA)
Dr. Debasis Bagchi (USA)
Dr. Colin Barrow (Australia)
Dr. Joseph Betz (USA)
Dr. Zhen-Yu Chen (Hong Kong)
Ms. Audra Davies (USA)
Dr. Colin Dennis (UK)
Dr. Chi-Tang Ho (USA)
Dr. Bo Jiang (China)
Dr. Junji Terao (Japan)
Dr. Se-Kwon Kim (Korea)
Dr. Hannu J. Korhonen (Finland)
Dr. Paul Kroon (UK)
Dr. Hyong Joo Lee (Korea)
Dr. Yoshinori Mine (Canada)
Dr. Kazuo Miyashita (Japan)
Dr. Hiroyoshi Moriyama (Japan)
Dr. Ronald B. Pegg (USA)
Dr. Augustin Scalbert (France)
Dr. Fereidoon Shahidi (Canada)
Dr. Young-Joon Surh (Korea)
Dr. Lucy Sun Hwang (Taiwan)
Dr. Junji Terao (Japan)
Dr. Chin-Kun Wang (Taiwan)
Dr. Roland Verhe (Belgium)
Dr. Rickey Yada (Canada)
Dr. Liangli Yu (USA)
Dr. Jerzy Zawistowski (Canada)

Conference Co-Organizers and Event Co-ordinators

Dr. Fereidoon Shahidi (Canada)
Dr. Kazuo Miyashita (Japan)

Conference Symposia

- Fundamental R & D of functional foods and nutraceuticals
- Processing of functional food ingredients and nutraceuticals
- Sensory aspects of functional foods
- Quality assurance of functional food ingredients, nutraceuticals and dietary supplements
- Asian and other traditional functional foods
- Tea, coffee, and chocolate
- Fermented foods
- Functional Beverages
- Palm-based nutraceuticals and health
- Nutraceuticals and functional foods in health and disease (heart health, cancer, diabetes, metabolic syndrome, gut health, etc)
- Nutraceuticals for obesity and weight control
- Omega-3 and other nutritional oils
- Marine nutraceuticals
- Nutraceutical and functional beverages
- Pre-, pro- and synbiotics
- Protein hydrolysates and biopeptides
- Phytochemicals: phenols, polyphenols, carotenoids, etc.
- Delivery systems for functional food ingredients, including nano-technology
- Absorption, metabolism and action mechanism of nutraceuticals and functional food ingredients
- Nutrigenomics, proteomics and metabolomics
- Global regulations, marketing and the buisness of nutraceuticals, dietary supplements and functional foods
- Nutraceutical pigments and colorants
- Algal-based functional food ingredients and bioproducts
- Antioxidants in action
- Dietary supplements
- Voluntary papers (oral and poster)

For further information, visit: ***isnff.org***

Disclaimer : Program details and speakers may change due to circumstances

UPCOMING NUTRACEUTICALS AND FUNCTIONAL FOODS EVENTS

March 2011

15-17. 8th International Conference. Functional Foods for Chronic Diseases: Science and Practice; University of Nevada, Las Vegas, NV, USA

23-24. Wellness 11; Rosemont, IL, USA

29. Pre- & Probiotics 2011: Building Gut Health Science & Claims; Virtual Conference

April 2011

18-20. Pharma-Nutrition 2011; Amsterdam, The Netherlands

May 2011

10-12. Vitafoods Europe 2011 – The Global Nutraceutical Event; Geneva, Switzerland

June 2011

11-14. IFT 11 Annual Meeting+Food Expo, New Orleans, LA, USA

14-16. International Scientific Conference on Probiotics and Prebiotics, IPC2011; Kosice, Slovakia

21-23. Nutraceutical Products China 2011; Shanghai, China

23-24. PROBIOTECH 2011; Milan, Italy

July 2011

25-27. Phytopharm 2011, the XV International Congress; Nuremberg, Germany

August 2011

25-26. Asian Nutracon: Functional Food & Beverage Workshop – From Market Analysis, Quality & Safety to Marketing Strategies, Hong Kong, China

September 2011

4-9. 59th International Congress and Annual Meeting of the Society for Medicinal Plant and Natural Product Research; Antalya, Turkey

7-9. Vitafoods Asia 2011 – The Global Nutraceutical Event; Hong Kong, China

October 2011

5-7. Health Ingredients Japan 2011, Tokyo, Japan

5-7. International Symposium on Health Benefits of Foods. From Emerging Science to Innovative Products; Prague, Czech Republic

12-13. Elderly & Medial Foods 2011, For Healthy Ageing & Growth; Amsterdam, The Netherlands

25-27. International Scientific Conference on Nutraceuticals and Functional Foods – Food and Function 2011; Kosice, Slovakia

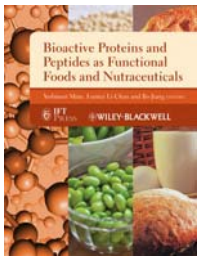
November 2011

14-17. ISNFF 2011 Annual Conference; Saporro, Japan

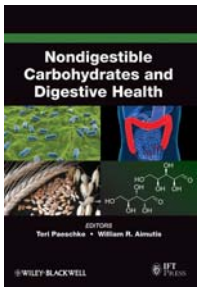
29-1 Health Ingredients Europe & Natural Ingredients; Paris, France

NEW TITLES FOR 2010 and 2011 (only those already published)

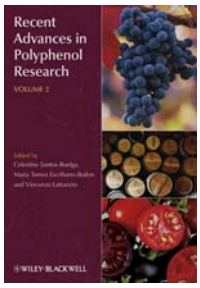
Listed alphabetically below are a number of recently published and upcoming titles dealing with nutraceuticals and functional foods.



Bioactive Proteins and Peptides as Functional Foods and Nutraceuticals, Editors: Yoshinori Mine, Eunice Li-Chan, Bo Jiang, Wiley-Blackwell, 2010, pp 436.



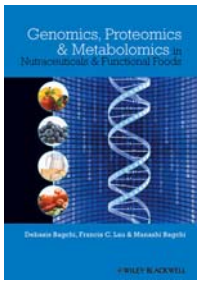
Nondigestible Carbohydrates and Digestive Health, Editors: Teresa M. Paeschke, William R. Aimutis, Wiley-Blackwell, 2010, pp 352.



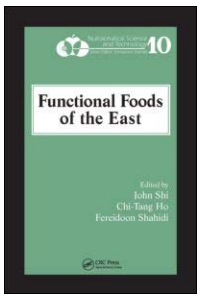
Recent Advances in Polyphenol Research, Volume 2, Editors: Celestino Santos-Buelga, Maria Teresa Escribano-Bailon, Vincenzo Lattanzio, Wiley-Blackwell, 2010, pp 352.

Handbook of Seafood Quality, Safety and Health Applications, Editors: Cesarettin Alasalvar, Kazuo Miyashita, Fereidoon Shahidi, Udaya Wanasundara, Wiley-Blackwell, 2010, pp 576.

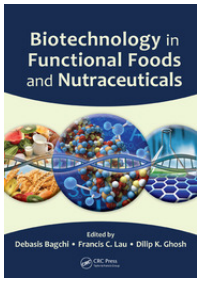
Functional Food Product Development, Editors: Jim Smith, Edward Charter, Wiley-Blackwell, 2010, pp 528.



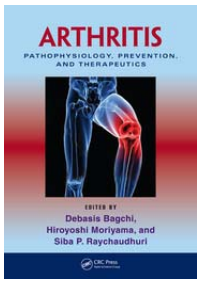
Genomics, Proteomics & Metabolomics, Editors: Debasis Bagchi, Francis Lau, Manashi Bagchi, Wiley-Blackwell, 2010, pp 352.



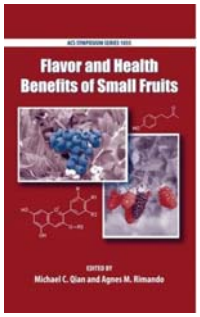
Functional Foods of the East, Editors: John Shi, Chi-Tang Ho, Fereidoon Shahidi, CRC Press, 2010.



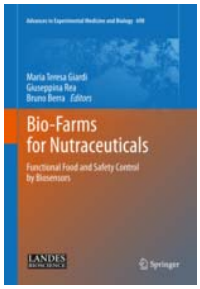
Biotechnology in Functional Foods and Nutraceuticals, Editors: Debasis Bagchi, Francis C. Lau, K. Ghosh, CRC Press, 2010, pp 591.



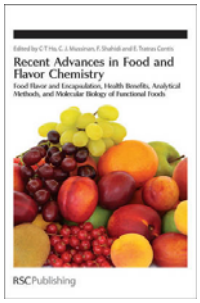
Arthritis: Pathophysiology, Prevention, and Therapeutics, Editors: Debasis Bagchi, Hiroyoshi Moriyama, Siba P. Raychaudhuri, CRC Press, 2010, pp 608.



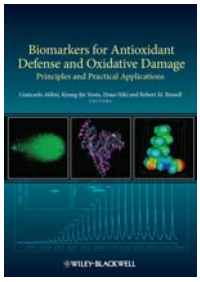
Flavor and Health Benefits of Small Fruits, Editors: Michael C. Qian, Agnes M. Rimando, American Chemical Society Symposium Series 1035, 2010, pp ???.



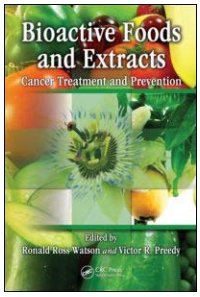
Bio-Farms for Nutraceuticals, Editors: Maria Teresa Giardi, Giuseppina Rea, Bruno Gerra, Springer, 2011, pp 65.



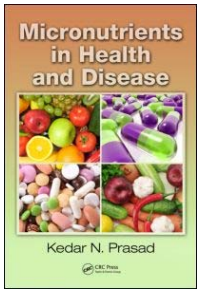
Recent Advances in Food and Flavor Chemistry. Food Flavors and Encapsulation, Health Benefits, Analytical Methods, and Molecular Biology of Functional Foods, Editors: Chi-Tang Ho, Cynthia Mussinan, Fereidoon Shahidi, Ellene Tratras-Contis, Royal Society of Chemistry, Springer, 2010, pp 474.



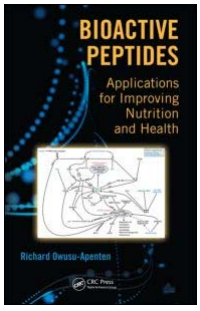
Biomarkers for Antioxidant Defense and Oxidative Damage, Editors: Giancarlo Aldini, Kyung-Jim Yeum, Etsuo Niki, Rober M. Russell, Wiley-Blackwell, 2010, pp 380.



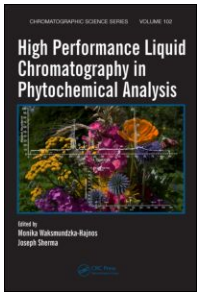
Bioactive Foods and Extracts: Cancer Treatment and Prevention, Editors: Ronald Ross Watson, Victor R. Preedy, CRC Press/Taylor & Francis, 2010, pp 663.



Micronutrients in Health and Disease, By: Kedar N. Prasad, CRC Press/Taylor & Francis, 2010, pp 391.



Bioactive Peptides: Applications for Improving Nutrition and Health, By: Richard Owusu-Apenten, CRC Press/Taylor & Francis, 2010, pp 414.



High Performance Liquid Chromatography in Phytochemical Analysis, Editors: Monika Waksmundzka-Hajnos, Joseph Sherma, CRC Press/ Taylor & Francis, 2010, pp 995.